The Path of Building a Double First-Class University in China Based on Excellent Performance

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Abstract. How to plan the efficient development path of "double first-class" construction and cope with the new development situation is an urgent problem for local universities in western China. This is both a severe test and a rare opportunity. This paper constructs a relationship model of the influence of performance excellence on the effectiveness of "Double First-Class" construction of local universities in western China, and introduces structural equation modeling to empirically analyze the proposed path hypothesis by combining the data collected from the empirical survey. The research results show that students, stakeholders and market, as well as resources and environment, play a key role in influencing the path and have a more significant positive impact on the effectiveness of "Double First-Class" construction of universities. Accordingly, in order to ensure the efficient implementation of the path planning, this paper provides relevant suggestions from two aspects: attaching importance to talent cultivation and strengthening resource construction.

Keywords: Excellent performance; Local universities in western China; "Double First-Class" construction; Structural equation model; Path

1 Introduction

Higher education, aiming at scientific, technological and cultural development, is of great significance in enhancing China's national competitiveness. In order to enhance the comprehensive strength of Chinese higher education, China has begun to implement the construction of world-class universities and first-class disciplines. These programs are known as "double first-class" [1]. Based on the above background, this paper analyzes the development path of "double first-class" construction of local universities in the west, combines the theory of performance excellence with the development status quo of local universities in the west, and uses structural equation modeling to design a model of how performance excellence affects the effectiveness of "double first-class" construction, and at the same time, puts forward relevant suggestions.

Over the past few decades, many local universities with a long history have been nurtured. These universities have made outstanding contributions to the local culture and economy. However, in the past, the development of local universities in the west of China has suffered from obstacles such as concrete identity and insufficient competitiveness. It is necessary to promote the double

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first-class construction to solve the above problems. It can be seen that local universities are an important part of developing Chinese higher education [2]. Compared with developed provinces, local universities in western China are located in the inland hinterland, with a lower level of development and relatively limited access to more resources. In the face of new development, the planning and implementation of the "double first-class" development route is the core issue for local universities in western China [3].

The "double first-class" strategy is a key step in advancing higher education in China and requires the application of a mature management system to safeguard its development [4]. The Performance Excellence Guidelines are divided into three categories - business, healthcare, and education - and are used to reward the best organizations in the United States in these three areas. Performance excellence includes organization, leadership, strategic planning, customer focus, measurement and analysis, knowledge management, employee orientation, process management and results [5]. Performance excellence is guided by total quality management and focuses on outcome performance. Performance excellence is centered on promoting student development and coordinating key issues in education [6]. It vigorously improves the quality of education with a systematic viewpoint and scientific indicators, and exists in close connection with the quality of teaching, the quality of scientific research, the future development of graduates, and the satisfaction of graduates. The cultivation of performance excellence aims to strengthen the foundation of the "double first-class" construction.

2 Model Assumptions

This paper combines the theory of performance excellence education with the development status quo of local universities in western China, in order to improve the scientificity of the combination of performance excellence and "double first-class" construction. In this paper, four factors, namely, leadership, resource environment and students, stakeholders and market, and organizational effectiveness, are selected as potential variables affecting the effectiveness of "double first-class" construction. Accordingly, these four factors are described and relevant hypotheses are proposed.

(1) The influence of leadership on related elements.

Leadership is a key element in the model of educational performance excellence. From the national policy level, the leadership of the state and government assists universities in western China to gain beneficial policies for introducing teachers and talents, establishing a sound incentive mechanism for talent innovation, and improving the level of faculty resources and team strength[7]. From the university level, on one hand, the leaders of local universities ensure the development of high quality teaching by monitoring and evaluation system and improving the effective incentive mechanism, which is conducive to lifting students' satisfaction on the basis of protecting teachers' own benefits [8]. On the other hand, the government plays a leading role for the society and the market to participate in university governance by establishing and improving relevant policies, regulating the relationship between the rights and interests of all parties in university governance[9]. Based on the above literature research and theoretical foundation for the relationship between leadership factors and other factors, the following three hypotheses are proposed.

H1: Leadership has a positive influence on the development of resources and environment of universities

H2: Leadership has a positive influence on students, stakeholders and markets

H3: Leadership has a positive influence on organizational performance outcomes

(2) The influence of resources and environment on relevant factors.

Physical environment factors have a much greater impact on the degree of satisfaction in school than individual factors and other institutional factors. To be specific, the support of policies and improved conditions can affect students' learning experience and on the degree of satisfaction[10].As the main stakeholder of talent cultivation from universities, the society needs to provide information and resources that match the contemporary development for the talent cultivation program of universities[11].As one of the core stakeholders of colleges and universities, it is important to improve faculty members' sense of identity and the degree of satisfaction by creating a well humanistic atmosphere[12].

As one of the important internal resources of universities, human resource has an impact on organizational performance in two aspects. On one hand, it promotes the motivation of university teachers to complete teaching tasks with higher quality by assessment and evaluation; on the other hand, it improves the organizational performance by incentive policy for teachers. Based on the teacher incentive policy for teachers, it is vital to bring a positive and competitive status for teachers[13]. Based on the above literature research and theoretical basis for the relationship between resources and environmental factors and other factors, the following two hypotheses are proposed:

H4: Resources and environment has a positive influence on students, relevant stakeholders and markets

H5: Resources and Environment has a positive influence on Organizational Performance Outcomes

(3) The influence of students, relevant stakeholders and the market on related factors.

Cameron (1978) proposed a nine-dimensional model for measuring organizational performance in higher education. In this model, dimensions such as students' educational satisfaction have an impact on organizational performance in higher education [14]. Some scholars have also empirically tested the influence relationship. The results show that market orientation is an important component that affects the level of organizational performance. The specific reason is that the market not only needs to maintain the feelings of customers, but also to take care of the ideas of other stakeholders [15]. In the quality evaluation index system of undergraduate education for "double first-class" construction, students' development and advancement to higher education, employers' evaluation of students, and the effectiveness of students' moral education are regarded as tertiary indicators under the evaluation index of educational outcomes [16]. Based on this, the following two hypotheses are proposed for students, stakeholders and market factors.

H6: Students, Stakeholders, and Markets have a positive influence on Organizational Performance Outcomes

H7: Students, stakeholders and the market have a positive influence on the "Double First-Class" construction Effectiveness

(4) The impact of organizational performance results on related elements.

The Measures for Evaluating the Effectiveness of the Construction of "Double First-Class" issued by the Ministry of Education of China clearly states that the evaluation of the construction of first-class universities mainly assesses the performance in six aspects, such as talent cultivation, faculty and staff construction, scientific research, social services, cultural heritage and international exchanges. The assessment of the construction of first-class disciplines mainly examines the comprehensive achievements of the construction disciplines in talent cultivation, scientific research, social service and faculty building. This shows that the organizational performance of colleges and universities is a direct reflection of the effectiveness of "double first-class" construction, and the improvement of organizational performance promotes the improvement of the effectiveness of "double first-class" construction in colleges and universities. Based on the above literature and theoretical basis, the following hypotheses are proposed.

H8: Organizational performance has a positive influence on the effectiveness of "Double First-Class" construction

Finally, based on the eight hypotheses, the theoretical model of this paper was constructed with four factors: leadership, resources and environment, students、stakeholders and market, and organizational performance results. The construction is seen as the affected results, as shown in Figure 1.

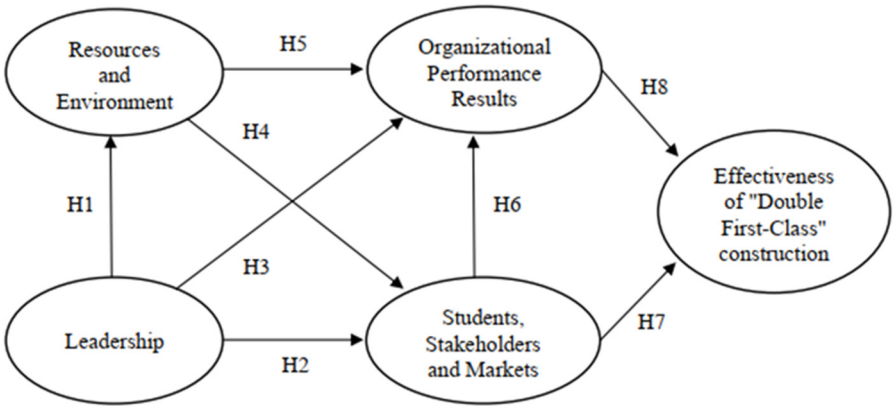

Fig. 1. Theoretical model of the impact of performance excellence on the effectiveness of "Double First-Class" construction

3 Methodology and Results

3.1 Questionnaire design and data collection

In this research, we referred to a number of performance excellence scales and questionnaires in education from abroad[17]. The questionnaire was designed with 25 questions on five latent

variables. The questionnaire was distributed to relevant personnel in a number of local universities in western China, the correspondents include leaders of the universities, faculty members, students and relevant enterprise personnel. The total number of distributed questionnaires was 300, of which 294 questionnaires were collected. There are 283 final valid samples as we eliminated 11 invalid samples containing abnormal and missing values.

3.2 Questionnaire reliability test

The reliability test of the questionnaire is generally analyzed using Cronbach's Alpha value [18], and the results of the reliability analysis of the data in this paper are shown in Table 1. The Cronbach's alpha value of this study is 0.908, which is greater than the target value, indicating that the reliability test is passed.

Table 1. Cronbach's Alpha test table

Cronbach Alpha	Cloning of Bach Alpha based on standardized terms	Number of items
0.908	0.908	25

3.3 Model goodness-of-fit test

The test of model goodness of fit is generally judged by GFI, CFI, TLI, RMSEA, SRMR and other data [19], and the results are shown in Table 2

Table 2. Model fitting indicators

Indicators	Model indicator values	Standard	Conclusion
CMID	285.355		
DF	267		
CMID/DF	1.069	<3 good fit; <5 acceptable	Good fit
GFI	0.928	>0.9 good fit	Good fit
AGFI	0.913	>0.9 good fit	Good fit
CFI	0.995	>0.9	Good fit
TLI (NNFI)	0.995	>0.9	Good fit
RMSEA	0.016	<0.08 Good fit; <0.1 Acceptable	Good fit
SRMR	0.060	<0.08	Acceptable
P-value	0.210	>0.05	Acceptable

Based on the numerical results of the indicators in the model from the above table and their corresponding acceptable ranges, the experimental values were compared with the reference values and the model goodness-of-fit index was found to meet the standard level, indicating that the model fit was good and no correction was needed.

3.4 Structural model validation

The path coefficients among the variables were calculated by bringing individual variables into the structural equations as shown in Figure 2.

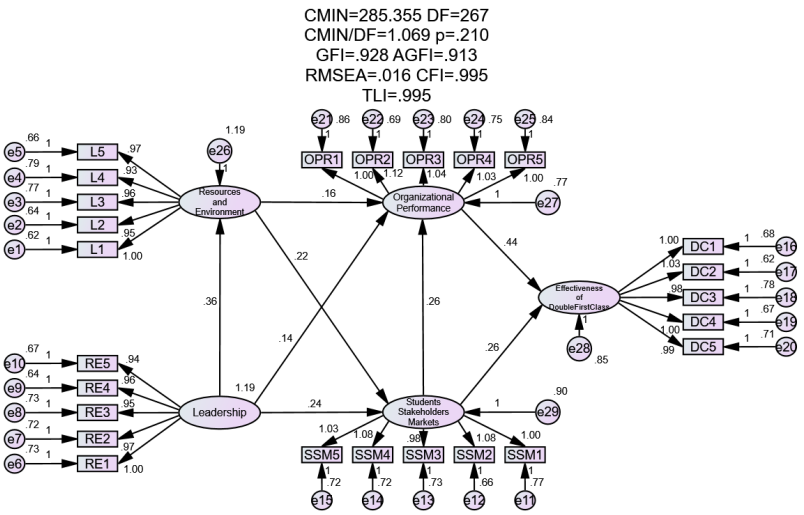

Fig. 2. Structural equation model diagram

According to the structural equation modeling diagram, the path coefficients and the corresponding p-values between the variables were counted, and the simulated path analysis results were obtained, as shown in Table 3. The results show that the path coefficients reach the significance level, so the original hypotheses H1-H8 can be verified.

Table 3. Simulated path analysis results

Research Hypothesis	Unstd.	C.R.	P	Std.(β)	Is it established
H1	0.359	5.049	***	0.337	Established
H2	0.245	3.705	***	0.256	Established
H3	0.138	2.175	0.030	0.152	Established
H4	0.219	3.575	***	0.244	Established
H5	0.163	2.746	0.006	0.190	Established
H6	0.257	3.759	***	0.269	Established
H7	0.436	5.555	***	0.394	Established
H8	0.260	3.703	***	0.246	Established

Note: ***p<0.001

3.5 Critical path analysis

Based on the analysis results of the above simulation paths, the following two critical paths were derived，as shown in Figure 3 and Figure 4.

(i) Pathways with students, relevant stakeholders and markets as key elements.

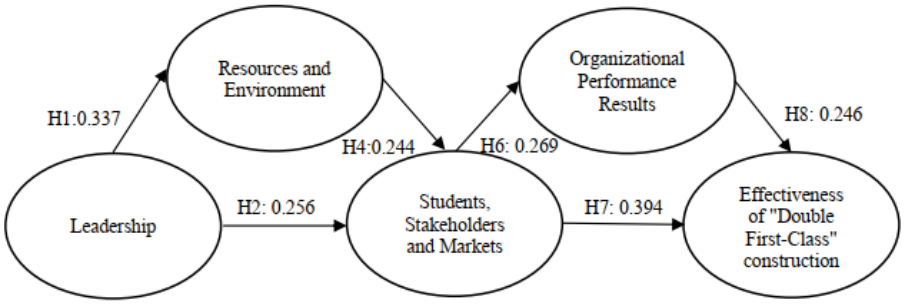

Fig. 3. Pathway relationship diagram with students, stakeholders and markets as key elements

A pathway diagram with students, stakeholders and markets as key elements was constructed, as shown in Figure 3. The results of the simulated pathway analysis show that the student, stakeholder and market elements are not only the central hub of the four elements of performance excellence, but also the key bridge that connects performance excellence and the effectiveness of "Double First-Class" construction. From the beginning of the path, leadership can positively influence students, stakeholders, and markets in two ways. One way is to use resources and environment as mediating variables to indirectly influence students, stakeholders and market factors. It is because that the leaders control the input and expenditure on environment and the allocation of resources in the universities. Another way is that leadership directly affects students, stakeholders and markets.It is highly possible that students can be directly influenced by the leadership in their philosophy of governance and school-running. And related stakeholders like companies and government, directly associate with leaders of the universities, and then have an influence on each other. Secondly, students, stakeholders and markets are correlates that influence the effectiveness of "double first-class" construction, and they influence the effectiveness of "double first-class" construction in two ways. First, with organizational performance results as the mediating variable, students, stakeholders and markets positively influence the effectiveness of "double first-class" construction. This indicates that students are the core of the organizational performance of universities, and the important indicators of the organizational performance of universities are mainly the learning outcomes of students, the satisfaction of enterprises with students, and the feedback of graduates when they are employed. On the other hand, talent cultivation is one of the important indicators for evaluating the effectiveness of the "double first-class" construction, and the overall development of students' moral, intellectual, physical, social and aesthetic development is both a powerful demonstration of the effectiveness of that construction.

(ii) The path with resources and environment as key elements.

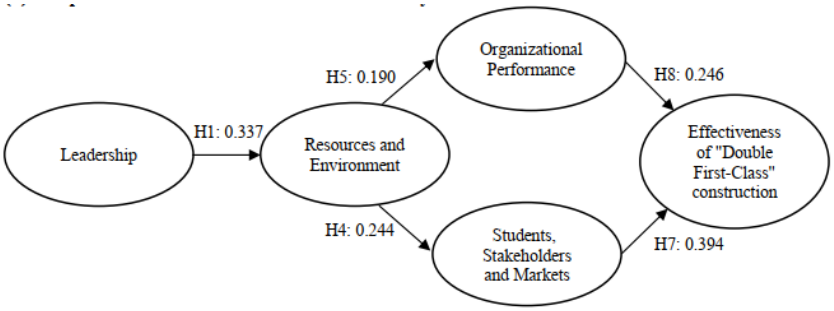

Fig. 4. Pathway relationship diagram with resources and environment as key elements

A path relationship diagram with resources and environment as key elements is constructed, as shown in Figure 4. Similar to the previous key path, this path also takes leadership as the initial factor, and positively influences resources and environment by improving human resource policy system and increasing investment in infrastructure construction on campus. Based on this, there are two paths for resources and environment to influence the effectiveness of "Double First-Class" construction. One pathway is to use students, stakeholders and the market as mediating variables to influence construction effectiveness. This is because colleges and universities improve the quality of teaching through high-quality faculty resources, benefit students' learning and life through improved infrastructure, and increase students' satisfaction with their campuses. Colleges and universities also build a platform for the integration of industry, academia and research through social and enterprise resources to improve students' scientific literacy and transform research results into applications. It promotes local development by meeting the needs of local enterprises and markets. On this basis, it improves the quality of talent training and ensures the advanced and scientific development of the discipline. In the other path, the resource environment has less impact on organizational performance, mainly to guarantee the work of universities, create a good academic environment, improve the satisfaction of teachers, students and staff, and provide basic support for achieving satisfactory organizational performance results.

4 Conclusions and Recommendations

This paper combines the concept of performance excellence developed in the field of business management with the construction of "double first-class" in local universities in western China, and the four elements of performance excellence, namely leadership, resources and environment, student stakeholders and market, and organizational performance results, are investigated and analyzed. Through empirical analysis, it is concluded that there is a significant positive impact of performance excellence on the effectiveness of "double first-class" construction. In addition, based on structural equation modeling, this paper plans two critical impact paths in the model. Based on the above research results, this study puts forward the following suggestions.

1. Improve the satisfaction of relevant parties by focusing on talent cultivation. Colleges should always adhere to the fundamental task of cultivating people with moral character, deepen the construction of course ideology and politics, help students establish a correct worldview, outlook on life and values, and strive to cultivate new era college students with ideals, skills and responsibilities. Combined with local characteristics to promote the construction of university talent training system, shoulder the glorious mission of realizing the strategy of strengthening the country with talents. Furthermore, universities should integrate local characteristics into the teaching process and cultivate specialists for local social development and industrial revitalization. It is also necessary to promote the construction of university-enterprise cooperation research laboratories, professional laboratories, disciplinary innovation contests, scientific research and technology practice and other projects to realize the integration of industry, education and research, so as to accurately and effectively meet the needs of local industries and the local economy for human resources in colleges and universities. Through the feedback of enterprises and changes in the market to dynamically adjust the talent training program, so that the applicability of talent training and industry demand in line with the commitment to improve the satisfaction of all parties concerned.

2. Strengthen infrastructure construction and enhance the capabilities of teaching faculty.Firstly, the universities need the national policies and the investment in education should be increased for universities in western China. The focusing points include improving student living conditions, teaching facilities and other facilities such as libraries and reading rooms. Secondly, local universities in western China should conduct self-examination and self-reform to attract outstanding talents. In this way, the universities should locate local characteristics of their own, integrated with discipline construction to make local characteristics a unique competitive advantage of discipline research. At the same time, the reform of internal governance mechanism of the universities offers teachers with higher level of autonomy, and create an open environment.

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